

agency under several aspects, especially in the formation of extensive sheets of rock.

It now has become proper to bring to a close these few observations, or rather this enumeration of heads of Natural-History subjects, by expressing a confident hope that this compilation will find many and well-qualified interpreters, and will be useful to geologists in general.

MISCELLANEOUS.

*On some Points in the Anatomy of the Genus *Fistulina*.*

By J. DE SEYNES.

THE species of the higher Fungi in which several forms of reproductive bodies have been indicated are still few in number. Three years ago I pointed out, in *Fistulina buglossoïdes*, Bull., some small sporiform bodies analogous to those to which, in many species of Fungi, M. Tulasne has ascribed the part of spore-producers and given the name of *conidia*. Further investigations on this subject have enabled me to make several observations, which I request permission to lay before the Academy.

The parenchyma of a *Fistulina* is composed of elongated cells of different calibre, increasing in size towards the interior. This tissue is traversed by some very long and generally narrower cells, filled with a red and not granular liquid, which becomes solid and brittle when dried. The transverse septa are so far apart that these cells might be taken for true vessels. I have every reason to believe that it is the same system of organs to which the name of laticiferous vessels has been given in the milky Agarics; I shall call them simply *reservoirs of proper juice*. I have observed them in many not milky Agarics and in a *Clavaria* (*C. aurantia*, Pers.). In *Fistulina* the cells which form them do not originate entirely in the intercellular spaces. Upon an ordinary cell of the parenchyma, or at its extremity, a cæcal process makes its appearance, filled with a yellow granular substance more abundant than that which also occurs in the mother cell; this substance appears to condense into a red liquid, which occupies the bottom of the cæcal cell. The latter elongates, and soon a transverse septum is formed near the point where it springs from the mother cell. This septum of course interrupts all direct communication with the mother cell, and it is even probable that subsequently there is a solution of continuity between these two cells; for when the reservoirs of proper juice are examined after they have arrived at their full development, they can no longer be found in direct connexion with the ordinary cells of the parenchyma. Near the upper surface of the pileus of *Fistulina*, these reservoirs, which are sometimes ramified, take a tortuous and rather spiral direction, which does not extend to the cells of the surrounding tissue; they are very numerous at this part, and in the dry fungus give to this subepidermic portion of the parenchyma the appearance of a black line.

Beneath this line there is a zone of 1-2 millims. in thickness, which, under a low magnifying-power, appears finely speckled with spots of a darker tint than the rest of the tissue. These spots correspond with the foci of development of the rounded, oval, or sometimes baculoid corpuscles which I have already described, and which I had only regarded as having arrived accidentally, or in consequence of the old age of the fungus, at the surface of the pileus. The zone that I have indicated as being the centre of their formation is prolonged into the pedicle; but none of it is found in the middle of the parenchyma, or in the vicinity of the lower surface which bears the hymenophorous tubes, or among these tubes.

All the *Fistulinae* that I have examined hitherto have presented this curious arrangement, whether they came from the Cevennes, the environs of Paris, or even the Himalaya, as I have ascertained from a specimen from the latter region, which is preserved in the Museum, in Montagne's herbarium. These conidia, far from reaching the outer surface, as if they were the product of a foreign parasite, only show themselves at the surface of the fungus after the destruction of the most external cellular layers; thus their dissemination can only be effected, as in the case of the spores of truffles, at the moment of the putrefaction of the fungus.

The cells which bear these conidia or sporiform bodies are more delicate and transparent than the others; but it is easy to prove that they have issued from the parenchyma itself. Sometimes they are long and bear a bunch of these little bodies; sometimes they are seen to detach themselves from a cell of the parenchyma in the form of a pedicle bearing only one such body, and not exceeding in length the longest axis of the latter.

Iodized chloride of zinc does not give the characteristic reaction of cellulose, either with the cells of the parenchyma, or with the spores, or with the conidia or pseudospores just mentioned. This reagent embrowns the reservoirs of proper juice, and reddens or renders yellow the cells of the parenchyma, according as they contain more or less plasmatic fluid. The conidiophorous cells, the fineness of which M. de Bary says he perceived when they were brought into contact with alcohol, and which, for this reason, he supposes not to originate directly from the parenchyma, become yellow under the influence of iodized chloride of zinc, and have a very pale tint, which distinguishes them from most of the surrounding cells; but in this they behave exactly in the same way as many other cells of the same fungus, either subhymenial cells, or cells of large diameter which, like the latter, have exhausted all the juices which they contained for the benefit of new formations.

Each of the observations that I have just cited contradicts the assertions made by M. de Bary in opposition to me (*Handbuch der physiologischen Botanik*, 1866, Bd. ii. p. 193); and although I regret that I thus disagree with that learned mycologist, my observations, often repeated and varied, leave no doubt in my own mind.

It remains for me to indicate in the organization of the *Fistulinae*

a fact which, if I am not mistaken, has not yet been pointed out, and the investigation of which might certainly be extended to the *Poly-pori* and other Fungi.

It has long since been observed (Geoffroy, 1711 ; Turpin, Vittadini, 1831 ; Tulasne) that the truffles present veins the white tint of which is due to the presence of air in the tissue composing them. Their arrangement, which at the first glance seems confused, is nevertheless sufficiently regular to allow them to be traced, either from a central point (*foveola*), whence they radiate towards the periphery, or in series starting from the surface of the truffle, where they open. These veins, according to M. Tulasne, are not circumscribed by a double membrane, as was supposed by Vittadini ; they are not, however, accidental, but are limited by elongated cells of the fructiferous pulp ; and in the young truffles it may be ascertained that these cells are arranged close together in ranks like paraphyses, in a direction perpendicular to that of the canal which they line.

Fistulina buglossoides, Bull., presents white lines which traverse its tissue in a definite direction ; now these narrow lines or veins also present this tint only in consequence of the air which is intercalated between their cells. There is no ready-formed canal bounded by a proper membrane ; the air insinuates itself (*se faufile*) between the cells, always following a determinate direction, from the base of the pedicle towards the periphery of the mushroom. It arrives in this way at the exterior, in part through the pilose tufts scattered over the non-fructifying surface, in part by traversing the length of the hymenophorous tubes. The presence of air seems to be connected, if not with the formation, at least with the maturation of the spores and conidia or pseudospores that I have indicated. Perhaps it is for this reason that the truffles, which fructify when protected from the atmosphere, are so abundantly furnished with air-passages. But until we have more numerous and extended investigations it would be imprudent to formulate a general law upon this subject. In any case it is interesting to find in low plants destitute of vessels a lacunar aerial circulation, which recalls the lacunar circulation of the blood in a great number of the lower animals destitute of, or only partially provided with, circulatory vessels.—*Comptes Rendus*, March 4, 1867.

ZIPHIUS SOWERBIENSIS.

A fine male specimen of *Ziphius Sowerbiensis* has been cast ashore on the coast of Kerry. Unfortunately the peasantry had cut it to pieces before it was seen by any person interested in the subject. The head, with the teeth, has fortunately been preserved in a perfect state ; and Mr. Andrews has read a paper on the specimen before the Royal Dublin Society. A fuller account, with plates, will be published in the 'Transactions of the Royal Irish Academy.' This is only the second male specimen that has been obtained.